

WHAT IS CLAIMED IS:

1. A method for registering an off-line produced web having pre-produced objects longitudinally spaced at a pitch interval to a converting line manufacturing disposable absorbent articles, such as diapers, pull-ups, feminine hygiene articles, and the like, or a component of a disposable absorbent article, the off-line produced web being manipulated as a controlled web in order for the pre-produced object of the controlled web to be registered in relation to a target bias position and in control automatically with the pitched unit operation, and automatically phase the target position bias, the method comprising the steps of:
 - a. providing a controlled web having pre-produced objects spaced at a controlled pitch interval, wherein the controlled web being provided at a controlled velocity in a machine direction;
 - b. providing an actual bias position of the pre-produced object on the controlled web by detecting the pre-produced object with a sensor within a manufacturing cycle of a pitched unit operation;
 - c. providing the target bias position at a desired position within a manufacturing cycle of the pitched unit operation;
 - d. generating a correction signal based upon the actual bias position data and the target bias position constant;
 - e. adjusting the controlled velocity of the controlled web in order to register the pre-produced object of the controlled web in relation to the target bias position constant;
 - f. coupling the pitched unit operation with a controlled web metering point by providing a converter position reference signal fed forward from the pitched unit operation functioning as an independent axis to the controlled web metering point functioning as a dependent axis in order for the pre-produced object of the controlled web be in phase automatically with the pitched unit operation; and
 - g. adjusting the target position in order to phase the actual position based on the controlled web bias.
2. A method for registering an off-line produced web having pre-produced objects longitudinally spaced at a pitch interval to a converting line manufacturing disposable absorbent articles, such as diapers, pull-ups, feminine hygiene articles, and the like, or a component of a disposable absorbent article, the off-line produced web being manipulated as a controlled web in order for the pre-produced object of the controlled web to be registered in

relation to a target bias position and in control automatically with a first pitched unit operation and automatically phase the first pitched unit operation in order to maintain phase of the pre-produced web with a second pitched unit operation, the method comprising the steps of:

- a. providing a controlled web having pre-produced objects spaced at a controlled pitch interval, wherein the controlled web being provided at a controlled velocity in a machine direction;
- b. providing an actual bias position of the pre-produced object on the controlled web by detecting the pre-produced object with a sensor within a manufacturing cycle of a pitched unit operation;
- c. providing the target bias position at a desired position within a manufacturing cycle of the first pitched unit operation;
- d. generating a correction signal based upon the actual bias position data and the target bias position constant;
- e. adjusting the controlled velocity of the controlled web in order to register the pre-produced object of the controlled web in relation to the target bias position constant;
- f. coupling the first pitched unit operation with at least one controlled web metering point by providing a converter position reference signal fed forward from the second pitched unit operation functioning as an independent axis to the controlled web metering point functioning as a dependent axis in order for the pre-produced object of the controlled web be in phase automatically with the first pitched unit operation;
- g. inferring the pre-produced object pitch from the registration control loop output and using feedforward gain to automatically adjust a target phase offset position of the second pitched unit operation in order to compensate for variations in the pre-produced object pitch and to maintain the proper phase relationship.

3. The method of claim 2 wherein the first pitched unit operation is used to slit a diaper ear web into two separate webs and the second pitched unit operation is used to cut said webs into discrete parts for subsequent application onto another web.

4. The method of claim 3 wherein the diaper ear web is processed at a constant web tension.

5. The method of claim 1 wherein the controlled web is processed at a constant web tension.
6. The method of claim 2 wherein the controlled web is processed at a constant web tension.